

WHAT IS CLAIMED IS:

1. A forward position lighting device configured to be installed at a wing of an aircraft, the aircraft wing corresponding to a particular mounting platform, the device comprising:

5 a plurality of modular components, including a mounting module on which one or more solid-state light sources are mounted,

wherein the modular components are configured so that the device is operably compatible with multiple types of mounting platforms.

2. The device of claim 1, wherein the solid-state light sources
10 are light-emitting diodes (LEDs), the LEDs being configured to emit at least one of aviation red and aviation green light.

3. The device of claim 2, further comprising:
a cut-off shield module configured to limit the light emitted by the LEDs according to predetermined angular cut-off parameters.

15 4. The device of claim 1, wherein the mounting module includes a heat sink.

5. The device of claim 4, the mounting module comprising a casting, wherein the heat sink comprises cooling fins incorporated in the casting of the mounting module.

20 6. The device of claim 1, wherein the modular components further comprise,

a base assembly module including electronic circuitry that electrically connects the solid-state light sources to a power source within the aircraft.

25 7. The device of claim 6, wherein the base assembly module is replaceable.

8. The device of claim 6, wherein the base assembly module is one of the following two interchangeable types: a first type whose electronic circuitry is passive, and a second type whose electronic circuitry is active.

5 9. The device of claim 8, wherein the base assembly module is of the second type, the active electronic circuitry being configured as a current control device for distributing a constant current to the solid state light sources as the power source voltage fluctuates.

10 10. The device of claim 6, wherein the base assembly module includes a heat sink.

11. The device of claim 10, the base assembly module comprising a casting, wherein the heat sink comprises cooling fins incorporated in the casting of the base assembly module.

15 12. The device of claim 6, further comprising a fastening mechanism operable to fasten the mounting module to the base assembly module, and thereby fasten the device to the aircraft wing.

13. The device of claim 12, wherein the fastening mechanism includes at least one screw and corresponding clearance holes in the mounting module, base assembly module, and aircraft wing.

20 14. The device of claim 12, further comprising:
a cut-off shield module configured to limit the light emitted by the solid-state light sources according to predetermined angular cut-off parameters,

25 wherein the cut-off shield module is fastened to the mounting module and base assembly module via the fastening mechanism.

15. The device of claim 1, the mounting module having dimensions, which are compatible with each of the multiple types of mounting platforms, thereby allowing the device to be mounted to the

mounting platform without retrofitting the device or modifying the mounting platform.

16. A forward position lighting device utilizing light emitting diodes (LEDs), the device configured to be installed at a wing of an aircraft, the device comprising:

a mounting module including:

two side-emitting LEDs;

one or more reflectors operable to reflect at least a portion of light emitted by the side-emitting LEDs, the side-emitting LEDs and reflectors being configured so that the light emitted by the side-emitting LEDs and the light reflected by the reflectors combine according to a first distribution of light; and

a lambertian LED operable to emit light according to a second distribution of light,

wherein the lambertian LED is configured so that the first and second distributions of light combine to form a pattern of light.

17. The device of claim 16, further comprising:

a cut-off shield module operably connected to the mounting module, the cut-off shield module being configured to limit the pattern of light according to predetermined angular cut-off parameters.

18. The device of claim 17, wherein the cut-off shield module includes:

an overlap shield component configured to limit overlapping between the second distribution of light and another forward position light of the aircraft.

19. The device of claim 18, wherein the cut-off shield module includes:

an auxiliary overlap shield component configured to limit overlapping between the first distribution of light and the other forward position light of the aircraft.

20. The device of claim 19, wherein the overlap shield and auxiliary overlap shield components provide angular cut-offs to the first and second distributions of light that correspond to predetermined maximum intensity requirements.

5 21. The device of claim 19, wherein the cut-off shield module includes:

 a perimeter shield component configured to limit overlapping between the pattern of light and a rear position light of the aircraft.

10 22. The device of claim 18, wherein an auxiliary overlap shield component is operably connected to the reflectors, the auxiliary shield component being configured to limit overlapping between the first distribution of light and the other forward position light of the aircraft.

15 23. The device of claim 18, wherein the dimensions of the mounting module and the cut-off module are compatible with each of a plurality of distinct mounting platforms, thereby allowing the device to be mounted to the distinct mounting platform without retrofitting the device or modifying the mounting platform.

20 24. The device of claim 16, wherein a shape of the reflectors is determined based on light-emitting characteristics of the side-emitting LED to produce the first distribution of light.

25 25. The device of claim 23, wherein each of the reflectors corresponds to one of the side-emitting LEDs, each of the reflectors including a curved reflective surface whose curvature is determined based on the light-emitting characteristics of the corresponding side-emitting LED to produce the first distribution of light.

26. The device of claim 23, wherein the shape of the reflectors is compatible with the light-emitting characteristics of both side-emitting LEDs that emit aviation red light, and side emitting LEDs that emit aviation green light.

27. The device of claim 16, wherein the dimensions of the device are compatible with multiple types of mounting platforms, thereby allowing the device to be mounted to each of the multiple types of mounting platform without retrofitting the device or modifying the mounting platform.

28. The device of claim 26, further comprising:
a base assembly module including electronic circuitry that electrically connects the lambertian and side-emitting LEDs to a power source within the aircraft, the base assembly module being interchangeable with a base assembly modules with different electronic circuitry.

29. Then device of claim 27, wherein at least one of the mounting module and the base assembly module comprises a casting that incorporates cooling fins, the cooling fins being operable as a heat sink.